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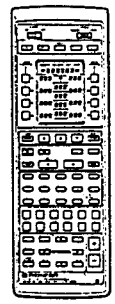
Service Manual



ORDER NO.
ARP1883

AUDIO VIDEO PROGRAMMABLE REMOTE CONTROL UNIT

CU-AV200

MODEL CU-AV200 HAVE TWO VERSIONS:

Type	Power requirement	Export destination
Z/UC	(DC power supply)	U.S.A.and Canada
Z/G	(DC power supply)	U.S.Military

• **This manual is applicable to the CU-AV200/Z/UC and Z/G types.**

CONTENTS

1. EXPLODED VIEWS AND PARTS LIST ····· 2
2. PACKING ····· 3
3. ELECTRICAL PARTS LIST ····· 4
4. SCHEMATIC DIAGRAM ····· 5
5. P.C. BOARD PATTERNS ····· 7
6. IC INFORMATION ····· 8
7. SPECIFICATIONS ····· 13
8. KEY NAMES AND FUNCTIONS ····· 14

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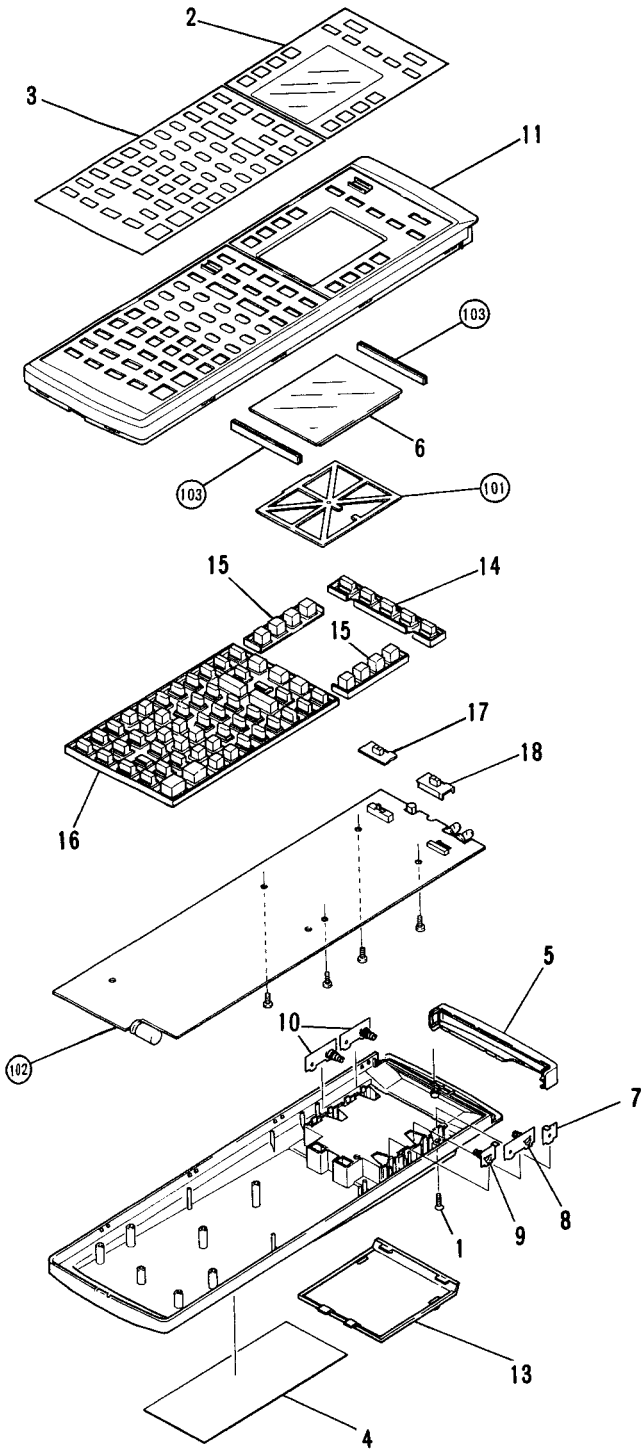
1. EXPLODED VIEWS AND PARTS LIST (AXD1125)

NOTES:

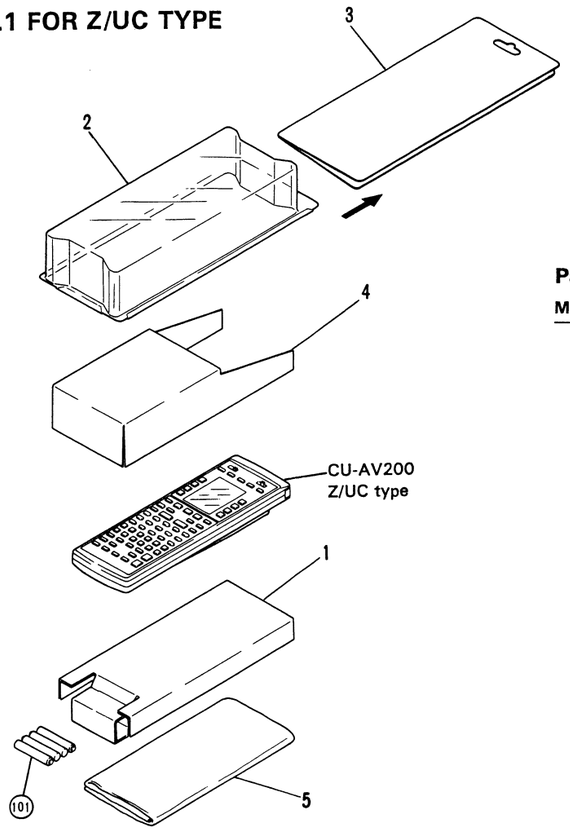
- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*



Mark	No.	Parts No.	Description
	1	AZA1146	Screw
	2	AZA1208	Name plate A
	3	AZA1209	Name plate B
	4	AZA1225	Label
	5	AZA1223	Filter
	6	AZA1224	LCD
	7	AZB1293	Electrode spring A
	8	AZB1296	Electrode spring D
	9	AZB1294	Electrode spring B
	10	AZB1295	Electrode spring C
	11	AZN1938	Case (A)
	12	AZN1939	Case (B)
	13	AZN1940	Battery cover
	14	AZN1941	Rubber sheet A
	15	AZN1942	Rubber sheet B
	16	AZN1943	Rubber sheet C
	17	AZN1945	Slide knob
	18	AZN1987	Slide knob
	101		Spacer
	102		P.W. board
	103		Zebra connector

2. PACKING

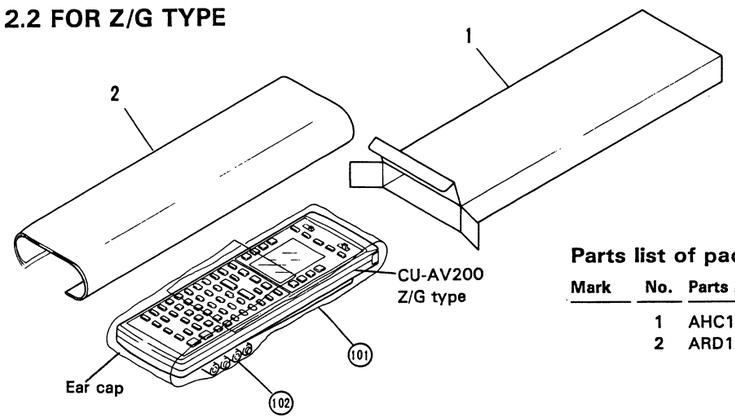
2.1 FOR Z/UC TYPE



Parts list of packing

Mark	No.	Parts No.	Description
	1	AHB1053	Spacer
	2	AHC1005	PVC case
	3	AHC1007	Rear case
	4	AHC1009	Inner case
	5	ARD1011	Operating instructions (Japan, English, French)
	101		Battery

2.2 FOR Z/G TYPE



Parts list of packing

Mark	No.	Parts No.	Description
	1	AHC1010	Packing case
	2	ARD1011	Operating instructions (Japan, English, French)
	101		Air cap A
	102		Battery

3. ELECTRICAL PARTS LIST

NOTES:

- *Parts without part number cannot be supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	*56 × 10¹*	*561*	*RD1/4PS 5 6 1 J*
47kΩ	*47 × 10³*	*473*	*RD1/4PS 4 7 3 J*
0.5Ω	*0R5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 × 10¹*	*5621*	*RN1/4SR 5 6 2 1 F*

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC1	HD74HC123AFP
	IC2	UPD7228G
	IC3	UPD74HC74G
	IC4	PD5120
	IC5	HD74HC139FP
	IC6	PDE030
	IC7	CXK5864BM−12L
	IC8	RH5VA42CA−T1
	Q1,Q2	2SD1622
	Q3	2SA1037KQ
	Q4,Q5	2SC3052E
	Q6	RN1404
	PD1	SPS−503C−3
	D1,D2	SLR−938C
	D3−D24	1SS181

SWITCH

Mark	Symbol & Description	Part No.
	SW1	JTM1990−0101
	SW2	JSB1320−0101
	SW3	SSSS2−S−011

CAPASITORS

Mark	Symbol & Description	Part No.
	C5	CCDSL221J50
	C6	CCDSL330J50
	C2,C4,C8,C14, C18,C20-C23	CKDYB103K50
	C16,C17	CCDCH200J50
	C1	CEAS101M10
	C3	CEAS4R7M50
	C9−C13	CKDYB331K50
	C24	CEAS470M16
	C25	CEAS471M25

RESISTORS

Mark	Symbol & Description	Part No.
	R1,R3	RD1/4PM□□□J
	Other resistors	RD1/8PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	X1 Crystal resonator	CSA−309

1. SCHEMATIC DIAGRAM

IC1	HD74HC123AFP
IC2	UPD7228G
IC3	UPD74HC74G
IC4	PD5120
IC5	HD74HC139FP
IC6	PDE030
IC7	CXK5864BM−12L
IC8	RH5VA42CA−T1
Q1,Q2	2SD1622
Q3	2SA1037KQ
Q4,Q5	2SC3052E
Q6	RN1404
PD1	SPS−503C−3
D1,D2	SLR−938C
D3−D24	1SS181

1. RESISTORS:
Indicated in Ω, ¼W, ⅛W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10% (M); ±20% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

3. OTHERS:
➡ : Signal route.
⊘ : Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

SWITCHES: SW1 : RESET
SW2 : EDIT−LEARN−USE
SW3 : FREE−VIDEO−AUDIO
S 2 : 1
S 3 : 5
S 5 : 2
S 6 : 3
S 7 : 4
S 9 : SP−B
S 10 : AMP POWER
S 12 : ◀◀
S 13 : ◀
S 14 : ▲
S 15 : ▶
S 16 : ▶▶
S 17 : ACOUST
S 18 : ◀
S 19 : ◀
S 20 : ●
S 21 : ■
S 22 : ▲
S 23 : VCR CH −
S 24 : VCR CH +
S 25 : SLEEP
S 26 : SP−A
S 27 : MASTER VOLUME −
S 28 : |◀◀
S 29 : ■
S 30 : ▶
S 31 : ❚❚
S 32 : ▶▶|
S 33 : MUTING
S 34 : SUR.MODE
S 35 : MASTER VOLUME +
S 36 : A
S 37 : B
S 38 : C
S 39 : D
S 40 : E
S 41 : TAPE1
S 42 : TAPE2
S 43 : PHONO
S 44 : USER NAMING ▶
S 45 : LINE
S 46 : CD
S 47 : TUNER
S 48 : USER NAMING ◀
S 49 : VCR1
S 50 : VCR2
S 51 : VIDEO
S 52 : USER NAMING ▶
S 53 : VCR3
S 54 : VDP
S 55 : TV
S 56 : USER NAMING ◀
S 58 : 11
S 59 : STATION TV CHANNEL +
S 60 : USER NAMING ▶
S 61 : 12
S 62 : +10
S 63 : STATION TV CHANNEL −
S 64 : USER NAMING ◀
S 66 : 6
S 67 : 0/10
S 68 : USER NAMING ▶
S 69 : 7
S 70 : 8
S 71 : 9
S 72 : USER NAMING ◀

5. P.C.BOARD PATTERNS

NOTE :

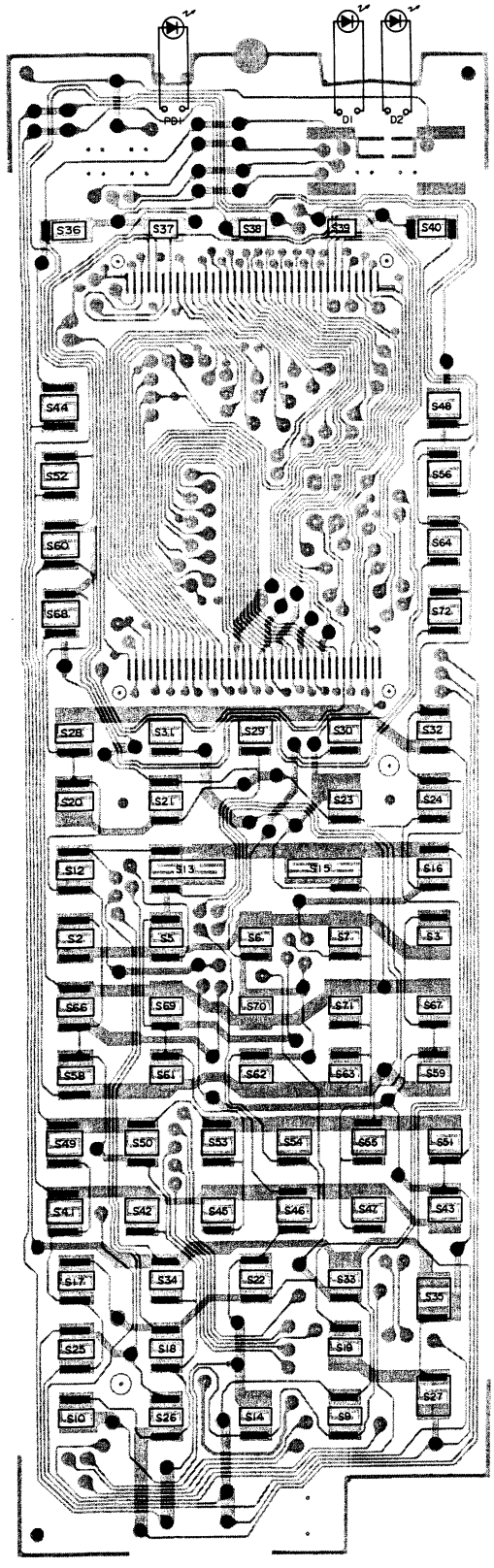
: Indicates a chip resistor.

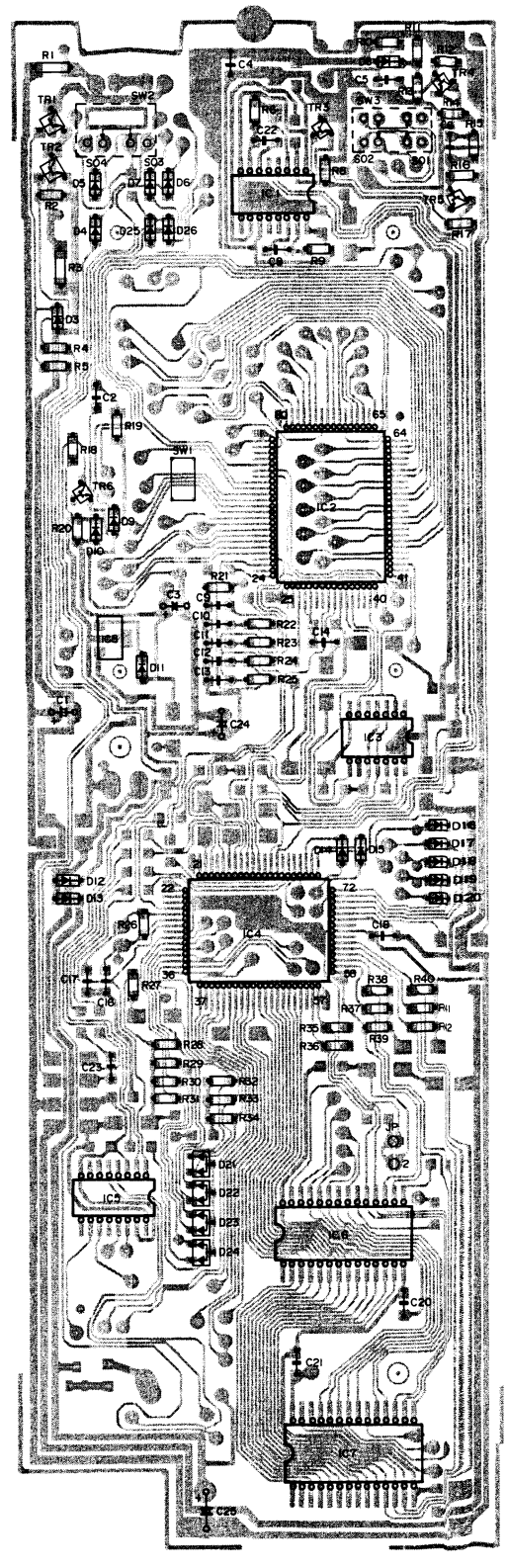
: Indicates a chip capacitor.

: Indicates a chip transistor.

: Indicates a chip diode.

: Indicates a diode.

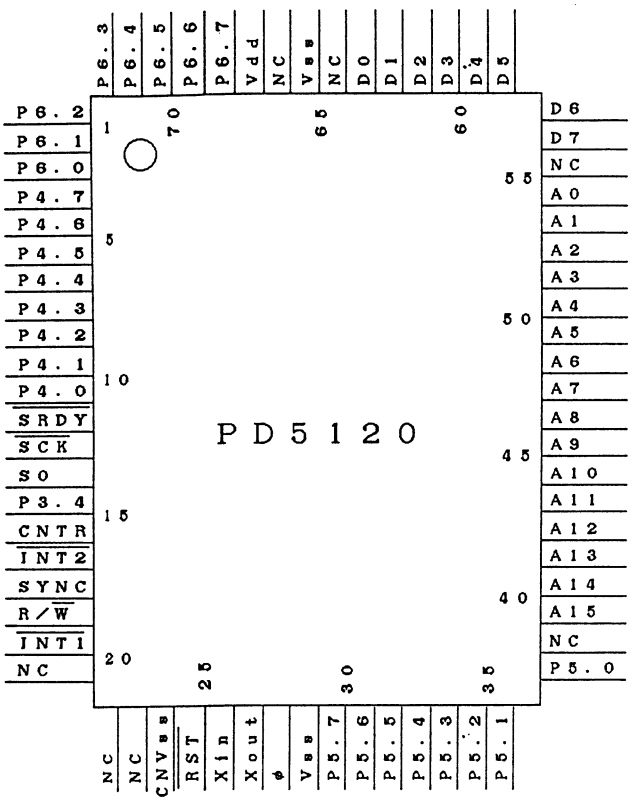




6. IC INFORMATION

6.1 PD5120

●Top view



●Terminal function

Note: I : CMOS input
O : CMOS output

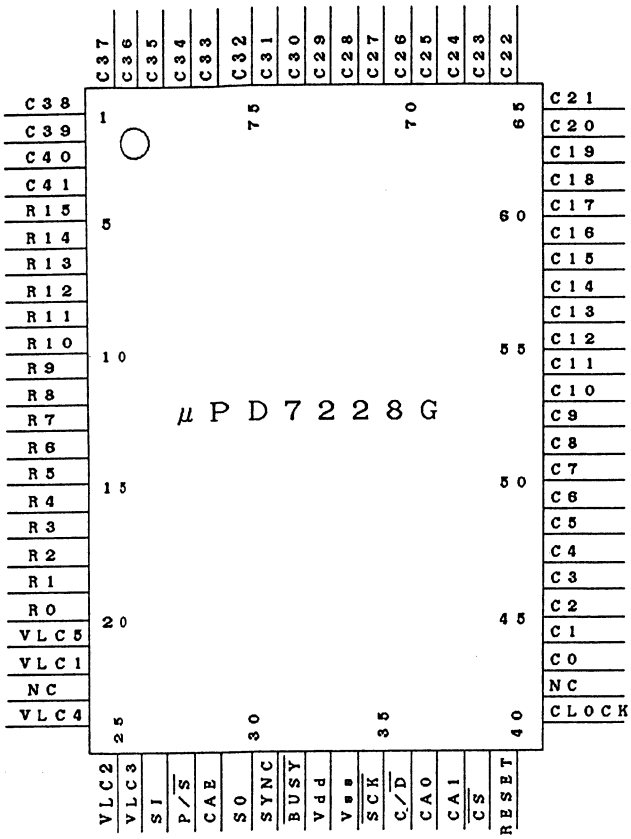
No.	Name	I/O	Function	Standby	Active
1	P6.2	O	Key scan output	L	L
2	P6.1	O	Key scan output	L	L
3	P6.0	O	Key scan output	L	L
4	P4.7	O	Key scan output	L	L
5	P4.6	O	Key scan output	L	L
6	P4.5	O	Remote control signal output strong/$\overline{\text{weak}}$ change-over output	L	H/L
7	P4.4	O	Remote control signal output	L	H
8	P4.3	O	Power line to remote control receiver circuit $\overline{\text{ON}}$/OFF output	H	L
9	P4.2	I	Remote control envelope signal input	—	L
10	P4.1	O	RESET signal output to UPD7228G	H	H
11	P4.0	O	Cmd/$\overline{\text{DATA}}$ select output to UPD7228G	L	H/L
12	$\overline{\text{SRDY}}$	O	CE control output to UPD7228G	L	H
13	$\overline{\text{SCK}}$	O	Clock output to UPD7228G	H	⌐↑
14	SO	O	Serial data output to UPD7228G	L	H/L
15	P3.4	I	$\overline{\text{BUSY}}$ signal input to UPD7228G	—	L
16	CNTR	I	Remote control signal input	—	H
17	$\overline{\text{INT2}}$	I	Key-on wake-up signal input	—	↓⌐
18	SYNC	O	No connection	L	—
19	R/$\overline{\text{W}}$	O	R/W signal output	H	H/L
20	$\overline{\text{INT1}}$	I	Remote control envelope signal input	—	↓⌐

No.	Name	I/O	Function	Standby	Active
21	NC	—	No connection	—	—
22	NC	—	No connection	—	—
23	NC	—	No connection	—	—
24	CNVss	I	GND (it can only be activated in the single chip mode)	—	—
25	RES	I	Reset signal input	—	L
26	Xin	I	Clock signal input	—	—
27	Xout	O	Clock signal output	—	—
28	ϕ	O	Timing clock signal output	H	H/L
29	Vss	—	GND	OV	OV
30	P5.7	I	Key scan input	—	L
31	P5.6	I	Key scan input	—	L
32	P5.5	I	Key scan input	—	L
33	P5.4	I	Key scan input	—	L
34	P5.3	I	Key scan input	—	L
35	P5.2	I	Key scan input	—	L
36	P5.1	I	Key scan input	—	L
37	P5.0	I	Key scan input	—	L
38	NC	—	No connection	—	—
39	A15	O	Address signal output	L	H/L
40	A14	O	Address signal output	L	H/L
41	A13	O	Address signal output	L	H/L
42	A12	O	Address signal output	L	H/L
43	A11	O	Address signal output	L	H/L
44	A10	O	Address signal output	L	H/L
45	A9	O	Address signal output	L	H/L
46	A8	O	Address signal output	L	H/L

No.	Name	I/O	Function	Standby	Active
47	A7	O	Address signal output	L	H/L
48	A6	O	Address signal output	L	H/L
49	A5	O	Address signal output	L	H/L
50	A4	O	Address signal output	L	H/L
51	A3	O	Address signal output	L	H/L
52	A2	O	Address signal output	L	H/L
53	A1	O	Address signal output	L	H/L
54	A0	O	Address signal output	L	H/L
55	NC	—	No connection	—	—
56	D7	I/O	Data signal input/output	L	H/L
57	D6	I/O	Data signal input/output	L	H/L
58	D5	I/O	Data signal input/output	L	H/L
59	D4	I/O	Data signal input/output	L	H/L
60	D3	I/O	Data signal input/output	L	H/L
61	D2	I/O	Data signal input/output	L	H/L
62	D1	I/O	Data signal input/output	L	H/L
63	D0	I/O	Data signal input/output	L	H/L
64	NC	—	No connection	—	—
65	Vss	—	GND	OV	OV
66	NC	—	No connection	—	—
67	Vdd	—	Power line	+5V	+5V
68	P6.7	O	Key scan output	H	L
69	P6.6	O	Key scan output	L	L
70	P6.5	O	Key scan output	L	L
71	P6.4	O	Key scan output	L	L
72	P6.3	O	Key scan output	L	L

6. 2 UPD7228G

●Top view



●Terminal function

Terminal 1−4: C38−C41 (Column) ···output
To output column drive signals from the LCD lines.

Terminal 5−12: R8/C49−R15/C42 (Row/Column) ···output
To output R8−R15 row drive signals or C49−C42 column drive signals from the LCD lines. You can select either row or column signals by using the SMM command. These are used with R8−R15 row drive signals in the CU−AV200 system.

Terminal 13−20: R0/R8−R7/R15 (Row) ···output
To output R0−R7 or R8−R15 row drive signals from the LCD lines. You can select either row or column signals by using the SMM command.

Terminal 23: N.C.

Terminal 21, 22, 24−26: VLC1−VLC5 (LCD Drive Voltage Supply) ···input
The reference voltage is applied here to scale the voltage level of the row/column drive signals on the LCD lines.

Terminal 27: SI (Serial Data In) ···input
These terminals work as input terminals of serial data in the serial interface mode. Data on the SI lines are loaded to the serial/parallel register at the rising transition of the $\overline{SCK}$. The first data become the MSB. These terminals have a Schmidt trigger circuit with a hysteresis property to reject mulfuctioning due to noise.

Terminal 28: P/S (Parallel/Serial Select) ···input
The parallel interface mode is selected when this input voltage is high at the falling transition of the RESET signal (cancelling RESET). When the voltage is low at the falling transition, the serial interface mode is selected. This terminal has a Schmidt trigger circuit with a hysteresis property to reject mulfuctioning due to noise.

Terminal 29: CAE (Chip Address Enable) ···input
CAE input is only effective when P/$\overline{S}$ input is low at the falling transition of the RESET signal (cancelling RESET), selecting the serial interface mode. The chip address function becomes enabled when the CAE input is high at this timing, and disabled when the CAE input is low. This terminal has a Schmidt trigger circuit with a hysteresis property to reject mulfactioning due to noise.

Terminal 30: SO (Serial Data Out) ···output
This terminal works as an output terminal of serial data in the serial interface mode. Synchronizing with the falling transition of the $\overline{SCK}$, data in the serial/parallel register are output by this SO terminal so that the MSB is output first.

Terminal 31: SYNC (Synchronous) ···three state input/output
This terminal is an input/output terminal for the signal to synchronize the phase and frame frequency in LCD drive AC signals (row/column signals) from all the UPD7228, when row drive signals are commonly used in the multi chip structure. In the multi chip structure, one is taken as the master chip whose SYNC terminal is set in the output mode, while others become slave chips whose SYNC terminals are set in the input mode. The selection between the input and output modes can be done by using the SMM command. The master chip in the output mode outputs a SYNC pulse in the last cycle of each frame. The slave chips read SYNC pulses of the master chip via their SYNC input terminals to synchronize with the master chip.

Terminal 32: $\overline{BUSY}$ (Busy) ···three state output.
This terminal outputs a $\overline{BUSY}$ signal to inform the CPU that the UPD7228 is busy with internal processing. When this is low, the CPU cannot execute read/write to the UPD7228 that is busy. $\overline{BUSY}$ signals become low at the second rising transition of the $\overline{STB}$ in the parallel interface mode or at the eighth rising transition of the $\overline{SCK}$ in the serial interface mode. $\overline{BUSY}$ signals become high when internal processing has been terminated. A $\overline{BUSY}$ output terminal shows high impedance when the chip has not been selected ($\overline{CS}$ is high, or incorrect chip address is given).

Terminal 33: VDD
This terminal is for the positive power line to the circuits.

Terminal 34: VSS
This terminal provides the GND voltage of circuits.

Terminal 35: $\overline{STB}$/$\overline{SCK}$ (Strobe/Serial Clock) ···input
This terminal works as a strobe signal input terminal ($\overline{STB}$) for 4−bit parallel data input/output in the parallel interface mode, and as a serial clock input terminal ($\overline{SCK}$) for serial data input/output in the serial interface mode.

Terminal 36: C/$\overline{D}$ (Command/Data) ···input
This teminal defines the parallel or serial input data to function as commands or data. C/$\overline{D}$ input is set to be high in the command input mode, while it is to be low in the data input mode. In either case, C/$\overline{D}$ input data are latched at the second rising transition of the $\overline{STB}$ in the parallel interface mode or at the eighth rising transition of the $\overline{SCK}$ in the serial interface mode. Note that in the parallel input mode, C/$\overline{D}$ input must be switched before the first falling transition of $\overline{STB}$. When outputting data, C/$\overline{D}$ output must always be low, regardless whether it is parallel or serial. This terminal has a Schmidt trigger circuit with a hysteresis property to reject mulfuctioning due to noise.

Terminal 37,38: CA0,1 (Chip Address) ···input
These terminals assign a proper address to each UPD7228, which is used as a part of the interface with the CPU to select the UPD7228 during forming the multi chip structure. CA0, 1 inputs are independent from the CAE input in the parallel interface mode, and are compared with the chip address data sent from the CPU when the chip address selection is activated with the CAE input in the serial interface mode.

Table 1−1 Setup of the CA1, 0 terminals

Mode	CA1, 0
Chip address is on	It must set up to one of 00, 01, 10, and 11 (only 00 can be used for the single chip)
• Always in the parallel mode	
• When CAE=1 in serial mode	
Chip address is off	00 must always be selected
• When CAE=0 in serial mode	

Note 1:
With the multi chip structure in the serial interface mode, the chip address function is not necessarily needed to select chips. It can be also made by feeding the chips with the same number of decoded $\overline{CS}$ signals. To do this, the CAE of all chips must be set to 0, and the CA1, 0 must be 00.
These terminal have a Schmidt trigger circuit with a hysteresis property to reject mulfuctioning due to noise.

Terminal 39: $\overline{CS}$ (Chip Select) ···input
This is a chip select input that is activated when the signal is low. With the chip address function deactivated, when the $\overline{CS}$ input is set to low, the $\overline{STB}$/$\overline{SCK}$ and C/D inputs become effective, and then the command input or data input/output can be accepted. When the chip address function is activated, the $\overline{STB}$/$\overline{SCK}$ and C/D inputs are only effective when the $\overline{CS}$ becomes low and the chip address data match with the CA0, 1 input. When the CS input becomes high, and D3−D0 and $\overline{BUSY}$ terminals show an unconditionally high impedance. This terminal has a Schmidt trigger circuit with a hysteresis property to reject mulfuctioning due to noise.

Terminal 40: RESET (Reset) ···input
This signal is a reset signal input terminal that is active when high. This has priority over any action. This signal cancels the standby mode, and is used to keep data in the data memory backed up by the low voltage power supply.

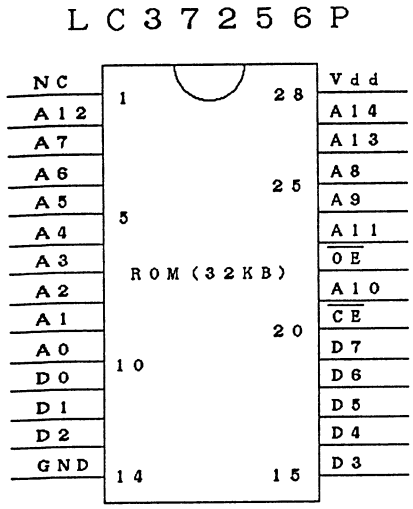
Terminal 41: CLOCK (Clock) ···input
This terminal serves for the external clock input.

Terminal 42: N.C.

Terminal 43−80: C0−C37 (Column) ···output
These terminal provide column drive signal output from the LCD.

6.3 LC37526P

● Top view



● Terminal function

Vdd:	Power line terminal
GND:	Ground
D0 – D7:	Data input/output terminal
A0 – A14:	Address input terminal
OE:	Output enable input terminal
CE:	Chip enable input terminal

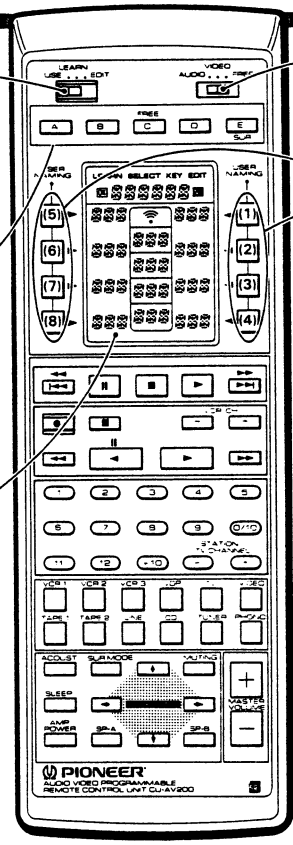
7. SPECIFICATIONS

Operation system	:	Programmed infrared remote control system
Applicable batteries	:	Four LR03/AM-4 alkaline batteries
Attachments	:	Four batteries, an operating instructions
Outer dimensions	:	72.5 (W) x 26.7 (H) x 221 (D) mm
Weight	:	170 g (excluding batteries)

NOTE:

- *Specifications and design subject to possible modification without notice due to improvements.*

8. KEY NAMES AND FUNCTIONS



MODE switch:
Use this to select the desired mode.
USE: This is the mode for normal operation.
LEARN: This is the mode used when learning commands of other remote control units.
EDIT: This mode offers 7 convenient editing functions for your enjoyment, including Block Copy, Memory Clear, and Pioneer's SR code recall.

FREE function/Remote control unit display ON keys:
Use these keys when the FUNCTION switch is in the FREE position. They also double as LCD display switches.
- If a key other than a FREE function key is pressed, the display will come on and the key pressed will immediately start to transmit.
- About one minute after operating a key, the display goes OFF automatically.

LCD display:
This shows you information concerning remote control when operating the MODE and FUNCTION switches.

FUNCTION switch:
Use this to select the component you want to operate.
AUDIO: To operate audio components.
VIDEO: To operate video components.
FREE: Use this to select an extra 5 functions (A to E).

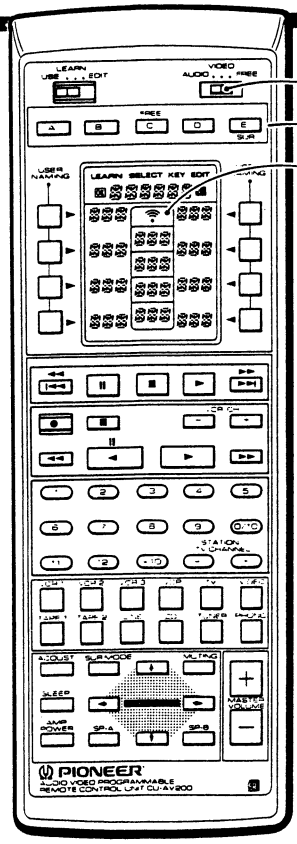
LCD operation keys:
The functions of these keys change depending on the settings of the MODE and FUNCTION switches. You can also change the names of the keys yourself.
Refer to "LCD OPERATION KEYS AND DISPLAY CHART" on page 29 for details concerning preset commands.

A block:
Use these keys to operate a CD player or LD (VDP) player.

B block:
Use these keys to operate a cassette deck (TAP) or VCR.
- When operating a Pioneer double cassette deck, they function as operation keys for Deck II. Use the LCD operation keys to operate Deck I when the FUNCTION switch is in the AUDIO position.

C block:
Use these keys to operate a tuner (TUN) or TV.

D block:
Use these keys to operate an AMP or SURROUND components.



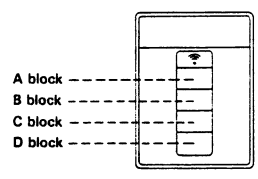
OPERATION KEYS AND LCD DISPLAY

FUNCTION switch

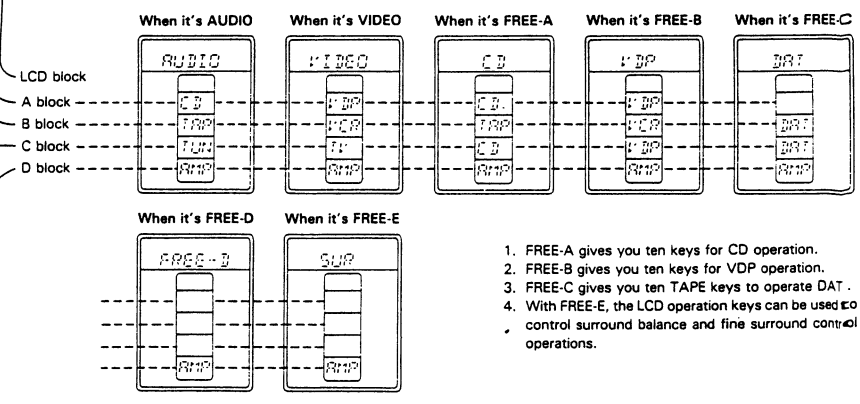
FREE function keys

This shows which components can be controlled and the operations of the keys.

- The mark indicates the remote control unit is transmitting.



Depending on the position of the function switch, the following components can be operated with the preset commands in each block.



1. FREE-A gives you ten keys for CD operation.
2. FREE-B gives you ten keys for VDP operation.
3. FREE-C gives you ten TAPE keys to operate DAT.
4. With FREE-E, the LCD operation keys can be used to control surround balance and fine surround control operations.